TABLE GIVING VALUES OF $P(c, \delta)$.

c	δ									
	0.1	0 2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
0	......	......	......	......	......	......	......	......	......	.....
1	.095163	.181269	.259182	.329680	.393469	.451188	.503415	.550671	.593431	.63212
2	.004679	.017523	.036936	.061552	.090204	.121901	.155805	.191208	.227518	.26424
3	.000155	.001148	.003600	.007926	.014388	.023115	.034142	.047423	.062857	.08030
4	.000004	.000057	.000266	.000776	.001752	.003358	.005753	.009080	.013459	.01899
5	.000000	.000002	.000016	.000061	.000172	.000395	.000786	.001411	.002344	.00366
6	......	.000000	.000001	.000004	.000014	.000039	.000090	.000184	.000343	.00059
7	......	......	.000000	.000000	.000001	.000003	.000009	.000021	.000043	.00008
8	......	......	......	......	.000000	.000000	.000001	.000002	.000005	.00001
9	......	......	......	......	......	......	.000000	.000000	.000000	.00000

Example.—Find value of P (20, 14.8).
Here $c = 20$, $a = 14$, $\delta = .8$.

t	$\epsilon^{-\delta}\delta^t/\underline{\lvert t}$, Table LI, page 113.	$P(c-t, a)$, Table LII, page 123.	$\frac{\epsilon^{-\delta}\delta^t}{\underline{\lvert t}} P(c-t, a)$.
0	.449329	.07650	.034374
1	.359463	.11736	.042186
2	.143785	.17280	.024846
3	.038343	.24408	.009359
4	.007669	.33064	.002536
5	.001227	.42956	.000527
6	.000164	.53555	.000088
7	.000019	.64154	.000012
8	.000002	.73996	.000001
9	.000000		.113929
		$P(c, \delta) = P(20,\ 0.8) =$	.000000
		$P(c, a+\delta) = P(20, 14.8) =$	.11393

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A SIMPLE SOLUTION OF THE DIOPHANTINE EQUATION $U^3 = V^3 + X^3 + Y^3$.

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There are many sets of four integers such that the cube of the first is equal to the sum of the cubes of the other three. For examples,

$$6^3 = 5^3 + 4^3 + 3^3, \tag{1}$$

$$9^3 = 8^3 + 6^3 + 1^3, \tag{2}$$

$$19^3 = 18^3 + 10^3 + 3^3. \tag{3}$$

The purpose of this paper is to deduce a formula by which an unlimited number of such sets may be obtained. It is an interesting question and has frequently engaged the attention of mathematicians. The problem has been treated by Diophantus, Fermat, Euler, and others. Notwithstanding their work, it is believed that the following solution may be of interest. Furthermore, by sub-

stantially the same method of deduction we may solve many other problems in indeterminate analysis, notably the following,

$$r^3 = s^3 + t^3 + u^3 + v^3,$$

$$r^3 = s^3 + t^3 + u^3 + v^3 + x^3,$$

and so on, for any greater number of terms whatever.

Problem. Given one set of four integers m, n, p, r such that

$$m^3 = n^3 + p^3 + r^3, \tag{4}$$

to find a formula for an indefinite number of such sets. Evidently,

$$(my)^3 = (ny)^3 + (py)^3 + (ry)^3 \tag{5}$$

where y may have any value whatever.

Assume

$$(my - bx)^3 = (ny - bx)^3 + (py - ax)^3 + (ry + ax)^3, \tag{6}$$

in which a and b are arbitrary constants.

We wish now to find such values of x and y as will make (6) an identity. Expanding in (6) and reducing, we find

$$(mb^2 - nb^2 - pa^2 - ra^2)x = (m^2b - n^2b - p^2a + r^2a)y.$$

We may therefore take

$$y = mb^2 - nb^2 - pa^2 - ra^2; \quad x = m^2b - n^2b - p^2a + r^2a.$$

Substitute these values for x and y in (6) and we obtain the required formula:

$$\begin{aligned}[(mp + mr)a^2 - (p^2 - r^2)ab + (mn - n^2)b^2]^3 \\ = [(np + nr)a^2 - (p^2 - r^2)ab + (m^2 - mn)b^2]^3 \\ + [(pr + r^2)a^2 + (m^2 - n^2)ab - (mp - np)b^2]^3 \\ + [(p^2 + pr)a^2 - (m^2 - n^2)ab - (mr - nr)b^2]^3.\end{aligned} \tag{A}$$

For example we may make $m = 6$, $n = 5$, $p = 4$, $r = 3$, and obtain

$$\begin{aligned}(42a^2 - 7ab + 5b^2)^3 = (35a^2 - 7ab + 6b^2)^3 \\ + (28a^2 - 11ab - 3b^2)^3 + (21a^2 + 11ab - 4b^2)^3,\end{aligned} \tag{B}$$

which holds for all values of a and b.

Thus, for $a = 10$ and $b = 1$, $4135^3 = 3436^3 + 2687^3 + 2206^3$.

Again, for $a = 1$ and $b = 4$, $103^3 = 94^3 + 64^3 - 1^3$.